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PATENT AND TRADEMARK OFFICE

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Appeal Brief
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Attorney Docket No.: OOCL-65 (US-P1496)

Applicant: **Yasuo TAKAHASHI**

Serial No.: **09/925,296**

Filing Date: **August 9, 2001**

Title: **BATTERY-OPERABLE PRINTER**

Examiner: **Ly T. Tran**

Group Art Unit: **2853**

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APPEAL BRIEF

Further to the Notice of Appeal filed on May 19, 2003 and granted a date of receipt of May 27, 2003 by the U.S. Patent & Trademark Office, which set a period of response to expire on July 27, 2003, that period being extended three (3) months to expire on October 27, 2003, the applicant requests that the Board reverse all outstanding grounds of rejection in view of the following.

I. Real Party In Interest

The real party in interest is Olympus Optical Co., Ltd., currently doing business as Olympus, Inc. An assignment of the above referenced patent application from the inventor to Olympus Optical Co., Ltd. was recorded in the Patent Office starting at Frame 0382 of Reel 012359.

II. Related Appeals and Interference

There are no related appeals or interferences.

III. Status of Claims

Claims 1-20 are pending and rejected.

More specifically, claims 1, 3-9, 11 and 13-20 stand rejected under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 5,631,677 (hereafter referred to as "the Horigome patent"), claims 2 and 12 stand rejected under 35 U.S.C. § 103 as being unpatentable over the Horigome patent (as applied to claims 1 and 11) in view of U.S. Patent No. 6,067,101 (hereafter referred to as "the Arakawa patent"), and claims 10 and 20 stand rejected under 35 U.S.C. § 103 as being unpatentable over the Horigome patent (as applied to claims 3 and 13) in view of U.S. Patent No. 6,247,777 (hereafter referred to as "the Shimoda patent").

IV. Status of Amendments

All amendments have been entered. No amendments were filed subsequent to the final Office Action mailed on January 17, 2003 (Paper No. 8.).

V. Summary of the Invention

The present invention concerns a printer comprising: a printing section for performing printing on paper (See, e.g., Figures 1, 2A and 2B, and page 9, lines 20-23 and page 19, lines 8 and 9.); a paper feed section for transferring paper which is fed from a paper feed cassette, to said printing section (See, e.g., page 11, lines 14-17, and page 18, lines 11-14.); a battery power source (See, e.g., Figure 1, element 12 and page 12, lines 7-20.); a

remaining-battery-capacity detector for detecting a remaining-battery-capacity level of said battery power source (See, e.g., elements 13 and 15 of Figure 1 and page 12, lines 11-18.); a print-operation-commencement specifying section for specifying print-operation commencement; (See, e.g., steps S11-S13 of Figure 4 and page, element 16 of Figure 1, and page 20, line 22 through page 21, line 9.); and control section for performing print-operation control (See, e.g., element 15 of Figure 1.), wherein the control section performs the print-operation control such that said remaining-battery-capacity detector is used to detect the remaining battery capacity level immediately before a paper transfer operation is commenced for the first sheet of the paper for a print operation (See, e.g., steps S16, S17 and S19 of Figures 4 and 6 and page 22 line 4 through page 23 line 19.) which is commenced corresponding to a print-operation commencement specification received from the print-operation-commencement specifying section (See, e.g., page 20, line 22 through page 21, line 2.); and the control section performs the print-operation control such that when printing is consecutively performed on a plurality of sheets of the paper corresponding to said print-operation commencement specification, said remaining-battery-capacity detector is used to detect the remaining battery capacity level immediately before the paper transfer operation is performed for the print operation for each of the plurality of sheets of the paper (See, e.g., Figure 4 and steps S16, S17, and S19 within loop including steps S14 and S26. See, e.g., also, Figure 6 and steps S16, S17, and S19 within loop including steps S16 and S26.).

This prevents printing from terminating partway during

through a sheet of paper. (See, e.g., page 28, lines 16-9.) This is advantageous. More specifically, with a printer employing a recording method, such as a dye fusion thermal transfer recording method or a dye diffusion thermal transfer recording method, a driving battery of the printer is depleted in a relatively short period. When printing is thereby terminated in print operation, a thermal-transferring inked ribbon tends to stop in a state where the ribbon is in contact with paper. When printing is resumed after the battery has been replaced with a new one, driving systems for the inked ribbon and the paper are driven to commence printing from the position where printing terminated partway. For this reason, deviations occur in the print-commencement position, and variations occur in the thermal-transfer temperature. Consequently, differences in density and coloration occur on printed portions where printing terminated partway and printing is resumed.

In a refined embodiment of the present invention, the determination section determines whether a paper-transfer operation and the print operation to be performed subsequent to the detecting operation for the remaining battery capacity level can be completed for at least one sheet of the paper according to the remaining battery capacity level detected by the remaining-battery-capacity detector. (See, e.g., page 22, lines 11-21, page 28, lines 10-13.)

In a refined embodiment of the present invention, when the determination section determines the remaining battery capacity level detected by the remaining-battery-capacity detector to be insufficient to complete the paper-transfer operation and the print operation, which are performed

subsequent to the detecting operation for the remaining battery capacity level, for at least one sheet of the paper, control is performed not to commence the paper-transfer operation. (See, e.g., NO branch of step S17 in Figures 4 and 6 and page 22, line 22 through page 23, line 10.).

In a refined embodiment of the present invention, when printing is specified to be consecutively performed on a plurality of sheets of the paper corresponding to a specification received from the print-operation-commencement specifying section, the determination section determines whether the transfer operations and the print operations can be completed all for the specified plurality of sheets of the paper according to the remaining battery capacity level detected by the remaining-battery-capacity detector. This number may be displayed to a user. (See, e.g., page 33, lines 3-15.)

In a refined embodiment of the present invention, a temperature detector for detecting the temperature in a peripheral environment of said battery power source is provided. A determination criterion used in the determination section is changed according to the detection result of said temperature detector. (See, e.g., page 29, line 11 through page 30, line 7.)

The present invention detects a battery capacity before each sheet is transferred, not at a particular time after printing has already commenced. Thus, if a print job is for a number (N) of sheets, but there is only sufficient battery capacity to complete less than the full number (N) of sheets, the present invention may be used to print a part of the print job until it cannot complete another

sheet. None of the prior art references teach this feature.

VI. Issues

The issues presented for review are:

(i) whether (separately patentable groups of) claims 1, 3-9, 11 and 13-20 are anticipated, under 35 U.S.C. § 102, by the Horigome patent;

(ii) whether claims 2 and 12 are unpatentable, under 35 U.S.C. § 103, over the Horigome patent (as applied to claims 1 and 11) in view of the Arakawa patent; and

(iii) whether claims 10 and 20 are unpatentable, under 35 U.S.C. § 103, over the Horigome patent (as applied to claims 3 and 13) in view of the Shimoda patent.

VII. Grouping of Claims

The claims do not stand or fall together.

For purposes of this Appeal, Appellant proposes the following grouping of claims:

Group I: Claims 1, 2, 6, 9, 11, 12, 16 and 19 are grouped together with claim 1 being selected as the single claim from the group upon which the appealed ground of rejection should be decided. Accordingly, claims 1, 2, 9, 11, 12 and 19 stand together.

Group II: Claims 3, 5, 13 and 15 are grouped together with claim 3 being selected as the single claim from the group upon which the appealed ground of rejection should be

decided. Although the claims of Group II are subject to the same rejection as the claims of Group I, these claims are separately patentable because they further specify that the determination section determines whether a paper-transfer operation and the print operation to be performed subsequent to the detecting operation for the remaining battery capacity level can be completed for at least one sheet of the paper according to the remaining battery capacity level detected by the remaining-battery-capacity detector.

Group III: Claims 4 and 14 are grouped together with claim 4 being selected as the single claim from the group upon which the appealed ground of rejection should be decided. Although the claims of Group III are subject to the same rejection as the claims of Groups I and II, these claims are separately patentable because they further specify that when the determination section determines the remaining battery capacity level detected by the remaining-battery-capacity detector to be insufficient to complete the paper-transfer operation and the print operation, which are performed subsequent to the detecting operation for the remaining battery capacity level, for at least one sheet of the paper, control is performed not to commence the paper-transfer operation.

Group IV: Claims 7, 8, 17 and 18 are grouped together with claim 7 being selected as the single claim from the group upon which the appealed ground of rejection should be decided. Although the claims of Group IV are subject to the same rejection as the claims of Groups I-III, these claims are separately patentable because they further

specify that when printing is specified to be consecutively performed for a plurality of sheets of the paper corresponding to a specification received from the print-operation-commencement specifying section, the determination section determines whether the transfer operations and the print operations can be completed all for the specified plurality of sheets of the paper according to the remaining battery capacity level detected by the remaining-battery-capacity detector, and displaying this information.

Group V: Claims 10 and 20 are grouped together with claim 10 being selected as the single claim from the group upon which the appealed ground of rejection should be decided. The claims of Group V are subject to a different ground of rejection than that of the claims of Groups I-IV.

VII. Argument

The applicant respectfully requests that the Board reverse the Examiner's the final rejection of claims 1-20 in view of the following.

REJECTIONS UNDER 35 U.S.C. § 102

Claims 1, 3-9, 11 and 13-20 stand rejected under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 5,631,677 (hereafter referred to as "the Horigome patent"). The applicant respectfully requests that the Board reverse this ground of rejection in view of the following. Separate groups are addressed separately.

Group I: Claims 1, 2, 6, 9, 11, 12, 16 and 19

Independent claims 1 and 11 are not anticipated by the

Horigome patent because the Horigome patent does not disclose a control section that performs print-operation-control such that a remaining-battery-capacity detector is used to detect a remaining-battery-capacity level immediately before a paper transfer operation is commenced for the first sheet of the paper for a print operation which is commenced corresponding to a print-operation-commencement specification received from said print-operation-commencement specifying section, and that performs print-operation control such that when printing is consecutively performed on a plurality of sheets of the paper corresponding to a specified print-operation-commencement, the remaining-battery-capacity detector is used to detect the remaining-battery-capacity level immediately before the paper transfer operation is performed for the print operation for each of the plurality of sheets of the paper. Claims 1 and 11 are reprinted below with these features depicted in bold typeface:

1. A printer comprising:
 - a printing section for performing printing on paper;
 - a paper feed section for transferring paper, which is fed from a paper feed cassette, to said printing section;
 - a battery power source;
 - a remaining-battery-capacity detector for detecting a remaining-battery-capacity level of said battery power source;
 - a print-operation-commencement specifying section for specifying print-operation commencement; and
 - control section for performing**

print-operation control,
wherein,

said control section performs the print-operation control such that said remaining-battery-capacity detector is used to detect the remaining battery capacity level immediately before a paper transfer operation is commenced for the first sheet of the paper for a print operation which is commenced corresponding to a print-operation commencement specification received from said print-operation-commencement specifying section; and

said control section performs the print-operation control such that when printing is consecutively performed on a plurality of sheets of the paper corresponding to said print-operation commencement specification, said remaining-battery-capacity detector is used to detect the remaining battery capacity level immediately before the paper transfer operation is performed for the print operation for each of the plurality of sheets of the paper.

[Emphasis added.]

11. A printer comprising:

a printing section for performing printing on paper;

a paper feed section for transferring paper, which is fed from a paper feed cassette, to said printing section;

a remaining-battery-capacity detector for detecting a remaining-battery-capacity level of a battery power source;

a print-operation-commencement specifying section for specifying print-operation commencement; and

a control section
wherein,

said control section performs print-operation control based on the remaining battery capacity level

detected by said remaining-battery-capacity detector immediately before a paper transfer operation is commenced for the first sheet of the paper for a print operation which is commenced corresponding to a print-operation commencement specification received from said print-operation-commencement specifying section; and

when printing is consecutively performed on a plurality of sheets of the paper corresponding to said print-operation commencement specification, said control section performs print-operation control based on the detected remaining battery capacity level immediately before the paper transfer operation is performed for the print operation for each of the plurality of sheets of the paper. [Emphasis added.]

These features will be addressed below.

The Horigome patent proposes a two-stage control procedure. (See, e.g., column 9, lines 11-19.) In this procedure, the capacity of a battery is sensed during printing, whenever a line is printed, and more specifically, when a carriage motor is being decelerated. (See, e.g., column 9, lines 13-16.) In a first stage, when the battery is partially depleted, the driving of the carriage motor and paper-feed motor are controlled so as not to overlap. In the second stage, if the battery capacity becomes dangerously low, low-power error processing is performed. More specifically, an off-line state is established, the carriage is returned to its home position and the printing head is capped. As can be appreciated from the foregoing, in the Horigome patent, battery capacity checks occur after a sheet has already been transferred to a printing section -- namely during the printing of each line when a carriage motor is decelerated.

The Examiner has nonetheless maintained this ground of rejection, arguing that the Horigome patent discloses monitoring the battery capacity at all times during a printing operation, and that therefore, it monitors before each sheet of paper is transferred, citing column 6, lines 36-40 of the Horigome patent. (See Paper No. 8, page 7.) This position is flawed in two ways. First, it ignores claim language. Second, it mischaracterizes the operations taught by the Horigome patent. Each of these flaws is discussed below.

First, even assuming, arguendo, that the Horigome patent did teach monitoring battery capacity at all times **during a printing operation**, such printing operations occur after a sheet has already been transferred. For example, the Horigome patent states "... a desired image is printed on the recording surface of the recording medium, **which has been conveyed** to a platen 35 from a paper-feed unit 34. [Emphasis added.]" Column 5, lines 38-40. Paper transfer before printing is not to be confused with paper feed during printing. For example, the specification of the present invention states:

According to the control, the paper-feed motor 29 is driven via the paper-feed motor driver 28 **so that paper is drawn out of the paper cassette 5 and is then transferred to a predetermined paper transfer path.** In addition, the microcomputer 15 performs control such that the thermal-head motor 31 is driven via the thermal-head motor driver 30, and the thermal head 38 is thereby closely engaged with the platen roller (not shown) in such a manner that the paper and the inked ribbon are sandwiched therebetween.

The compressed image data

specified for printing is read out of the SDRAM 22. Then, the image data is converted by the JPEG decoder 39 and the image-scaling circuit 40 to a print signal. Then, the print signal is temporarily stored in the SRAM 41.

Subsequently, the paper-feed motor 29 and the inked-ribbon motor 33 are driven to transfer the paper and the inked ribbon in the state where they are sandwiched between the thermal head 38 and the platen roller. Concurrently, according to the compressed image data specified for printing, the thermal-head controller 37 performs supply control for the heating power that is supplied from the power controller 13 through the head power feed line 42. Then, an image according to the image data is printed on the paper. [Emphasis added.]

(Page 18, line 11 through page 19, line 9) The specification of the present application also states:

if the currently remaining power capacity of the DC battery 12 is lower than the predetermined value, that is, if **transfer and printing** for one sheet of the paper which are performed subsequent to the detection of the remaining capacity level of the DC battery 12 cannot be completed with the currently remaining power capacity ...
[Emphasis added.]

(Page 22, line 22 through page 23, line 2.) As can be appreciated, in both the present invention and the Horigome patent, paper transfer occurs before printing and paper feeding associated with printing. Monitoring battery capacity during printing is not the same as monitoring battery capacity before paper transfer, which itself occurs

before printing. Accordingly, claims 1 and 11 are not anticipated by the Horigome patent for at least this reason. Since claims 2-10 depend, either directly or indirectly, from claim 1, and since claims 13-20 depend, either directly or indirectly, from claim 11, these claims are similarly not anticipated by the Horigome patent.

Second, by taking one phrase of the Horigome patent out of context, the Examiner mischaracterizes the operations taught by the Horigome patent. The Examiner quotes lines 36-38 of Column 6 of the Horigome patent which state, "... battery capacity during the printing operation is monitored at all times" (Emphasis added.) However, later in the same paragraph, the Horigome patent states:

To this end, it is necessary during the printing operation to detect the battery voltage in an interval of time in which the drop in battery voltage is largest [Emphasis added.]

Column 6, lines 41-43, and further states:

In this embodiment, therefore, sensing of battery capacity is performed in synchronization with deceleration pulses of the carriage motor 8. [Emphasis added.]

Column 6, lines 50-53. The Horigome patent also states:

The control procedure during a printing operation will now be described with reference to FIGS. 6A, 6B and 7.

In short, this processing involves sensing the capacity of the battery 20

during printing, this being performed one time, whenever one line is printed, while the carriage motor 8 is being decelerated. [Emphasis added.]

Column 9, lines 11-16. Thus, the Horigome patent is using the term "monitoring" to mean something different than "detecting" (which is the term used in the claims) or "sensing". Accordingly, claims 1 and 11 are not anticipated by the Horigome patent for at least this additional reason. Since claims 2 and 9 depend from claim 1, and since claims 12 and 19 depend from claim 11, these claims are similarly not anticipated by the Horigome patent.

To summarize, the present invention detects a battery capacity before each sheet is transferred, not at a particular time after printing has already commenced. Thus, if a print job is for a number (N) of sheets, but there is only sufficient battery capacity to complete less than the full number (N) of sheets, the present invention will print a part of the print job until it cannot complete another sheet. None of the prior art references teach this feature.

Group II: Claims 3, 5, 13 and 15

With regard to dependent claims 3 and 13, these claims recite that the battery capacity level is checked to see if at least one sheet of paper can be transferred and printed. The levels checked by the Horigome patent (whether carriage and paper feed motors be driven simultaneously, and, apparently, whether the printer in danger of not being able to complete another line and recap ink jet head) are different. The claims of Group II are therefore allowable

for this reason in addition to the reasons addressed above with respect to the claims of Group I.

Group III: Claims 4 and 14

Claims 4 and 14, which depend from claims 3 and 13, respectively, further specify not commencing a paper transfer operation in the event that the sheet cannot be transferred and printed. Accordingly, these claims are not anticipated by the Horigome patent for these further reasons (in addition to those addressed above with respect to the claims of Groups I and II).

Group IV: Claims 7, 8, 17 and 18

With regard to dependent claims 7 and 17 when a partial number of sheets can be printed, this fact is displayed. In the second embodiment of the Horigome patent in which a battery capacity is checked during the charging of a battery, the charging is stopped only when all of the desired number of sheets can be printed. Accordingly, these claims are not anticipated by the Horigome patent for this further reason (in addition to those addressed above with respect to the claims of Group I).

REJECTIONS UNDER 35 U.S.C. § 103

Claims 2 and 12 stand rejected under 35 U.S.C. § 103 as being unpatentable over the Horigome patent (as applied to claims 1 and 11 above) in view of U.S. Patent No. 6,067,101 (hereafter referred to as "the Arakawa patent"). The applicant respectfully requests that the Board reverse this ground of rejection in view of the following.

The Examiner concedes that the Horigome patent fails to teach a removable battery source, but relies on the

Arakawa patent as teaching such a removable battery source. (See, Paper No. 5, page 5.) Even assuming, arguendo, that the Arakawa patent provides such a teaching, it does not compensate for the deficiencies of the Horigome patent as applied to claims 1 and 11, set forth above. Since claims 2 and 12 depend from claims 1 and 11, respectively, they are not rendered obvious by the Horigome and Arakawa patents for at least this reason. These claims stand with the claims of Group I.

Group V: Claims 10 and 20

Claims 10 and 20 stand rejected under 35 U.S.C. § 103 as being unpatentable over the Horigome patent (as applied to claims 3 and 13 above) in view of the Shimoda patent. The applicant respectfully requests that the Board reverse this ground of rejection in view of the following.

The Examiner concedes that the Horigome patent fails to teach a temperature dependent battery capacity determination, but relies on the Shimoda patent as teaching such a test. (See, Paper No. 5, page 6.) Even assuming, arguendo, that the Shimoda patent provides such a teaching, it does not compensate for the deficiencies of the Horigome patent as applied to claims 3 and 13, set forth above. Since claims 10 and 20 depend from claims 3 and 13, respectively, they are not rendered obvious by the Horigome and Shimoda patents for at least this reason.

Moreover the Shimoda patent teaches checking temperature to (i) prevent failure of ink discharge (See, e.g., column 2, lines 11-17.), and (ii) prevent head deformation (See, e.g., column 2, lines 38-43.) That is, the Shimoda patent is concerned with head print failure, not the dependency of battery capacity on temperature.

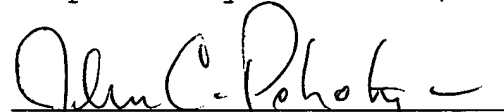
Therefore, there is no suggestion to combine the references as proposed by the Examiner. Accordingly, claims 10 and 20 are not rendered obvious by the Horigome and Shimoda patents for at least this additional reason.

Conclusion

In view of the foregoing amendments and remarks, the applicant respectfully submits that the pending claims are in condition for allowance. Accordingly, the applicant requests that the Board reverse each of the outstanding grounds of rejection.

Respectfully submitted,

October 27, 2003

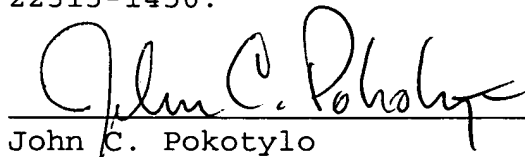


John C. Pokotylo, Attorney
Reg. No. 36,242
Customer No. 26479
(732) 335-1222

STRAUB & POKOTYLO
620 Tinton Avenue
Bldg. B, 2nd Floor
Tinton Falls, NJ 07724-3260

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John C. Pokotylo

36,242
Reg. No.



APPENDIX

1 Claim 1 (previously presented): A printer comprising:
2 a printing section for performing printing on paper;
3 a paper feed section for transferring paper, which is
4 fed from a paper feed cassette, to said printing section;
5 a battery power source;
6 a remaining-battery-capacity detector for detecting a
7 remaining-battery-capacity level of said battery power
8 source;
9 a print-operation-commencement specifying section for
10 specifying print-operation commencement; and
11 control section for performing print-operation
12 control,
13 wherein,
14 said control section performs the print-operation
15 control such that said remaining-battery-capacity detector
16 is used to detect the remaining battery capacity level
17 immediately before a paper transfer operation is commenced
18 for the first sheet of the paper for a print operation
19 which is commenced corresponding to a print-operation
20 commencement specification received from said print-
21 operation-commencement specifying section; and
22 said control section performs the print-operation
23 control such that when printing is consecutively performed
24 on a plurality of sheets of the paper corresponding to said
25 print-operation commencement specification, said remaining-
26 battery-capacity detector is used to detect the remaining
27 battery capacity level immediately before the paper
28 transfer operation is performed for the print operation for
29 each of the plurality of sheets of the paper.

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1 Claim 2 (original): A printer as defined in claim 1,
2 wherein said battery power source is connected to a main
3 unit of said printer to be removable.

1 Claim 3 (original): A printer as defined in claim 1,
2 further comprising a determination section for determining
3 whether a paper-transfer operation and the print operation
4 to be performed subsequent to the detecting operation for
5 the remaining battery capacity level can be completed for
6 at least one sheet of the paper according to the remaining
7 battery capacity level detected by said remaining-battery-
8 capacity detector.

1 Claim 4 (original): A printer as defined in claim 3,
2 wherein, when said determination section determines the
3 remaining battery capacity level detected by said
4 remaining-battery-capacity detector to be insufficient to
5 complete the paper-transfer operation and the print
6 operation, which are performed subsequent to the detecting
7 operation for the remaining battery capacity level, for at
8 least one sheet of the paper, control is performed not to
9 commence the paper-transfer operation.

1 Claim 5 (original): A printer as defined in claim 3,
2 wherein, when said determination section determines the
3 remaining battery capacity level detected by said
4 remaining-battery-capacity detector to be insufficient to
5 complete the paper-transfer operation and the print
6 operation, which are performed subsequent to the detecting
7 operation for the remaining battery capacity level, for at
8 least one sheet of the paper, a display unit displays
9 information indicating that the remaining battery capacity

10 is short.

1 Claim 6 (original): A printer as defined in claim 3,
2 wherein, when printing is specified to be consecutively
3 perform the plurality of sheets of the paper corresponding
4 to a specification received from said print-operation-
5 commencement specifying section, said determination section
6 determines whether the transfer operations and the print
7 operations can be completed all for the specified plurality
8 of sheets of the paper according to the remaining battery
9 capacity level detected by said remaining-battery-capacity
10 detector.

1 Claim 7 (original): A printer as defined in claim 6,
2 wherein, when said determination section determines the
3 remaining battery capacity level detected by said
4 remaining-battery-capacity detector to be sufficient only
5 to complete the paper-transfer operations and the print
6 operations for partial number of sheets of the paper in the
7 paper-transfer operations and the print operations for the
8 specified plurality of sheets of the paper, said display
9 unit displays information indicating that printing can be
10 performed only for the partial number of sheets of the
11 paper.

1 Claim 8 (previously presented): A printer as defined in
2 claim 7, wherein said display unit displays a number of
3 printable sheets of the paper for the information
4 indicating that printing can be performed only for the
5 partial number of sheets of the paper.

1 Claim 9 (original): A printer as defined in claim 1,

2 wherein said remaining-battery-capacity detector detects
3 the remaining battery capacity level also when said printer
4 is powered on.

1 Claim 10 (original): A printer as defined in claim 3,
2 further comprising a temperature detector for detecting the
3 temperature in a peripheral environment of said battery
4 power source, wherein a determination criterion used in
5 said determination section is changed according to the
6 detection result of said temperature detector, said
7 determination criterion being used to determine whether the
8 paper-transfer operation and the print operation, which are
9 performed subsequent to the detection operation for the
10 remaining battery capacity level, can be completed for at
11 least one sheet of the paper.

1 Claim 11 (previously presented): A printer comprising:
2 a printing section for performing printing on paper;
3 a paper feed section for transferring paper, which is
4 fed from a paper feed cassette, to said printing section;
5 a remaining-battery-capacity detector for detecting a
6 remaining-battery-capacity level of a battery power source;
7 a print-operation-commencement specifying section for
8 specifying print-operation commencement; and
9 a control section
10 wherein,
11 said control section performs print-operation control
12 based on the remaining battery capacity level detected by
13 said remaining-battery-capacity detector immediately before
14 a paper transfer operation is commenced for the first sheet
15 of the paper for a print operation which is commenced
16 corresponding to a print-operation commencement

17 specification received from said print-operation-
18 commencement specifying section; and
19 when printing is consecutively performed on a
20 plurality of sheets of the paper corresponding to said
21 print-operation commencement specification, said control
22 section performs print-operation control based on the
23 detected remaining battery capacity level immediately
24 before the paper transfer operation is performed for the
25 print operation for each of the plurality of sheets of the
26 paper.

1 Claim 12 (original): A printer as defined in claim 11,
2 further comprising a battery power source that is connected
3 to a main unit of said printer to be removable.

1 Claim 13 (original): A printer as defined in claim 11,
2 further comprising a determination section for determining
3 whether a paper-transfer operation and the print operation
4 to be performed subsequent to the detecting operation for
5 the remaining battery capacity level can be completed for
6 at least one sheet of the paper according to the remaining
7 battery capacity level detected by said remaining-battery-
8 capacity detector.

1 Claim 14 (original): A printer as defined in claim 13,
2 wherein, when said determination section determines the
3 remaining battery capacity level detected by said
4 remaining-battery-capacity detector to be insufficient to
5 complete the paper-transfer operation and the print
6 operation, which are performed subsequent to the detecting
7 operation for the remaining battery capacity level, for at
8 least one sheet of the paper, control is performed not to

9 commence the paper-transfer operation.

1 Claim 15 (original): A printer as defined in claim 13,
2 wherein, when said determination section determines the
3 remaining battery capacity level detected by said
4 remaining-battery-capacity detector to be insufficient to
5 complete the paper-transfer operation and the print
6 operation, which are performed subsequent to the detecting
7 operation for the remaining battery capacity level, for at
8 least one sheet of the paper, a display unit displays
9 information indicating that the remaining battery capacity
10 is short.

1 Claim 16 (original): A printer as defined in claim 13,
2 wherein, when printing is specified to be consecutively
3 perform the plurality of sheets of the paper corresponding
4 to a specification received from said print-operation-
5 commencement specifying section, said determination section
6 determines whether the transfer operations and the print
7 operations can be completed all for the specified plurality
8 of sheets of the paper according to the remaining battery
9 capacity level detected by said remaining-battery-capacity
10 detector.

1 Claim 17 (original): A printer as defined in claim 16,
2 wherein, when said determination section determines the
3 remaining battery capacity level detected by said
4 remaining-battery-capacity detector to be sufficient only
5 to complete the paper-transfer operations and the print
6 operations for partial number of sheets of the paper in the
7 paper-transfer operations and the print operations for the
8 specified plurality of sheets of the paper, said display

9 unit displays information indicating that printing can be
10 performed only for the partial number of sheets of the
11 paper.

1 Claim 18 (original): A printer as defined in claim 17,
2 wherein said display unit displays a number of printable
3 sheets of the paper for the information indicating that
4 printing can be performed only for the partial number of
5 sheets of the paper.

1 Claim 19 (original): A printer as defined in claim 11,
2 wherein said remaining-battery-capacity detector detects
3 the remaining battery capacity level also when said printer
4 is powered on.

1 Claim 20 (original): A printer as defined in claim 13,
2 further comprising a temperature detector for detecting the
3 temperature in a peripheral environment of said battery
4 power source, wherein a determination criterion used in
5 said determination section is changed according to the
6 detection result of said temperature detector, said
7 determination criterion being used to determine whether the
8 paper-transfer operation and the print operation, which are
9 performed subsequent to the detection operation for the
10 remaining battery capacity level, can be completed for at
11 least one sheet of the paper.